hydrogen (H) atom much more readily than a halogen atom (because the second O-H bond in water is very strong relative to C-H bond energy). Consequently, HFCs and HCFCs have significantly lower tropospheric lifetimes (and GWPs) relative to similar CFCs or perfluorocarbons.

Although it will be possible to determine relative GWPs for different source gases relatively easily, all these compounds have significant GWPs (because of their large IR intensities in the window region). Hence, it is probably best for industries to adopt abatement procedures when using these types of compounds.

Point of Contact: T. Lee
(650) 604-5208
tlee@pegasus.arc.nasa.gov

Environmental Research Aircraft and Sensor Technology—New Technologies for Earth Science

Stephen S. Wegener, James Brass

The Environmental Research Aircraft and Sensor Technology (ERAST) project is an Aerospace Technology Enterprise (NASA Headquarters Code R) program designed to provide focus for critical technology development and flight demonstration that reduces the technical and economic risk of using remotely piloted aircraft (RPA) as a means to collect scientific data in a timely and cost-effective manner. A government industry alliance (ERAST) is flying RPA in science missions with 400-pound (lb) (182 kilogram (kg)) payloads to altitudes of 55,000 feet (ft) (16.7 kilometers (km)).

Ames has the leadership role in developing sensors and science missions for ERAST. In FY99, ERAST passed a major milestone by supporting the Uninhabited Aerial Vehicle/Atmospheric Radiation Measurement (UAV/ARM) Tropical Cirrus Mission from Barking Sands, HI. Ames provided the coordination to match science needs and ERAST flight opportunities to meet this milestone. ERAST sensor support also developed one of the key instruments flown by an Ames investigator. Seven science flights were conducted during the four-week series. The total flight time above 16.7 km was 16.5 hours. Flights to 16.7 km were the highest the UAV/ARM payload has ever flown.

The ERAST Science and Sensor Element also promoted new RPA payloads and missions for atmospheric science, remote sensing, and others, including:

- Disaster management with Global Disaster Information Network (GDIN)
- Over-the-horizon (OTH) and real-time technologies for missions and vehicles
- Support of the development of the Earth Sciences Enterprise NASA Research Announcement for science and applications
- Promotion of the partnership between California Resources Agency—ARC and ERAST to systematically map California in a high-resolution sharable digital database
- Promotion of the Commercial Remote Sensing Program partnership with ERAST

The ERAST Science and Sensor Element also promoted educational and commercial outreach to support existing and planned RPA science activities at various conferences and exhibitions. One highlight included producing the Hawaii State Fair CD, which provided an overview of the ERAST, the Pathfinder, the Remote Sensing imagery from Hawaii, including flight maps, a mini-tutorial on remote sensing, and an explanation of how the imagery was acquired and manipulated. Examples of many images were provided along with simple procedures to access some 1400 images archived in Hawaii. Collaborators in this research include Susan Schoenung (Longitude 122° W), and Don Sullivan and Vince Ambrosia (Johnson Controls World Services).

Point of Contact: S. Wegener
(650) 604-6278
swegener@mail.arc.nasa.gov